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C-RR - 240/64
19 March 1964
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MEMORANDUM FOR: Chief, Resources Division, ORR

ATTENTION : [redacted] 25X1

THRU : Chief, RG/RB/CGS

FROM : Chief, CIA/PID (NPIC)

SUBJECT : Extent of Wind Erosion, Kazakhstan, USSR

REFERENCE : a. Requirement No. C-RR4-81,159
b. Requirement No. C-RR3-80,625 (Project No. C 1341-63)
c. GMB Memorandum 771/63 (22 November 1963)

1. In response to Requirement No. C-RR4-81,159, requesting an evaluation of the extent of wind erosion in relation to total agricultural land or plowland in Kustanay and Pavlodar Oblasts in Kazakhstan, PID/GMB (NPIC) provides the following analysis.

2. The Geo-Military Branch, after a detailed study of the area, is convinced that an evaluation is not possible of wind erosion in the Kazakhstan 'New Lands' region. The reasons for this conviction may be separated into two categories: (a) the nature of soil removal, and (b) the detection of plowland. These are reviewed in the following paragraphs.

3. Except in an area where dunes are to be seen, or where scattered blowouts occur, wind erosion generally leaves a plane surface not unlike that found in the same plains location previous to its action. Dunes are sand deposits. Blowouts may be in either sandy or finer soil areas, but are often small and irregular in shape, leaving them almost undetectable. In the area in question two examples of such irregular field surfaces were noted, one covering three or four fields east of Pavlodar, and the other in a brush pastureland farther west that most probably had never been plowed. No dunes were observed, as would be expected in a region where there are no natural large, unvegetated spaces, and where soil is fine in composition. From a soil scientist's point of view, soil, in a mature profile, as may be found in undisturbed portions of the area of interest, is layered into horizons: A,B, and C. The A horizon commonly called topsoil, is finely comminuted, mixed with organic matter and, in a semiarid region, has mineral nutrients left in it by evaporating of moisture from the surface. The C horizon is the sedimented underlying base, and the B horizon is gradational between the two. In such a region as this the A, or producing, horizon may

vary in thickness from three or four inches to a foot, and because the materials are fine they may be carried away from any field, leaving no detectable physical trace of the removal. If only a B horizon remains on a field, crops are poor unless the basal soil is especially good and growing conditions ideal. From a physical viewpoint the field would appear the same on the photo coverage available here for use. In other words, soil removal by wind leaves no trace in the appearance of the field unless soil particles are coarse enough so they are moved only limited distances and then redeposited in recognizable heaps. Interestingly, certain fields are beneficiaries of wind erosion in that soil removed from the surface tends to return in certain favored locations where winds, vegetation cover, and other factors are favorable.

4. In a surveyed plains region where road patterns and settlements dot the landscape a pattern of squares or rectangles is found except where streams and topographic irregularities intervene. Farmyards, pasture, waste land (swamps, playas) permanent grass, once-plowed or recently-plowed land and also never-plowed fields occupy most of the area. The general idea that it is all cultivated land is developed by association. On the photo coverage available, identification of a plowed field can be proved only if and when one sees it under the plow or in process of harvest. It is perhaps unfortunate that the DESPA series of maps indicates the flat land of North Kazakhstan as agricultural, because that does not mean plowed. The green color is also misleading. Old squares of plowed land show up like old caravan trails in semiarid regions, not necessarily because they are eroded but because the sod and permanent grass are lacking.

A crop failure is most evident at harvest time, although some signs may remain as long as the harvest evidence is left on the field. But crop failures can occur on natural haylands as well as on plowed land, so it is only when the analyst can distinguish between harvests of hay and grain and can evaluate the abundance of the harvest in progress, that quantity can be recognized on a single field. But quantity of straw is not equivalent to harvest. And crop failure may result from a number of soil, atmospheric, or biologic problems that are not related to wind erosion, and the analyst may only possibly be able to find evidence of a single cause. The need is to realize that plowed land, crop failure, and wind erosion are not necessarily related at any given place at a given time.

5. Actual confirmable evidence of wind erosion in total, of the 200,000 square miles of land covered in the referenced study, would not encompass more than ten or twenty square miles in area. This does not mean that there may not be more, but only that such an assessment is virtually impossible in a realistic, meaningful evaluation.

6. The photo analysis on this project was performed by [redacted], CIA/PID/GMB (NPIC), who may be contacted on [redacted] for any additional information.

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